UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/737,942	12/18/2000	Lauri J. Karttunen	D/99503	1109

7590	06/22/2005

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EXAMINER
SKED, MATTHEW J

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/737,942	KARTTUNEN ET AL.
	Examiner	Art Unit
	Matthew J Sked	2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-20* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-20* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *19 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/11/02*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Examiner acknowledges receipt of the preliminary amendment, filed 2/26/01.

Claim Rejections - 35 USC § 101

2.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1 and 15 are drawn to a mathematical algorithm, per se. Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are non-statutory. If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing all of the foregoing, the acts are not being applied to appropriate subject matter. Schrader, 22 F.3d at 294-95, 30 USPQ2d at 1458-59. Thus, a process consisting solely of mathematical operations without some claimed practical application is drawn to non-statutory subject matter. In this case, the claims merely recite the steps of producing an input finite-state network, creating a first temporary finite-state network, creating a second temporary finite-state network, computing the cross product of the first temporary finite-state network and producing an output finite state network, without any practical application being recited.

Allowable Subject Matter

3.   Claims 1 and 15 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 101, set forth in this Office action.

4.   The following is a statement of reasons for the indication of allowable subject matter: Claims 1 and 15 recite the combination of producing an input finite state network that has a set of paths with at least one of those paths containing a delimited subpath where the delimited subpath encodes on an indicated side a delimited substring formatted as a regular expression, creating a first temporary finite-state network by extracting the delimited subpath from the input finite state network and eliminating the symbols on the indicated side of the delimited subpath, creating a second temporary finite state network by compiling the delimited substring formatted as a regular expression, computing the cross product between the first and second temporary finite state networks to produce a resulting finite-state network that is used to replace the delimited substring in the input finite-state network to produce an output finite-state network.

5.   Kempe (PCT Pub. WO 99/01828) teaches compiling finite state transducers for speech by providing an incomplete set of class sequences, tagging the class sequences using a HMM to produce a tag sequence of a first type, providing a set of tag sequences of a second type and combining the two sets of tag sequences to build a FST (claim 5).

6.   Chung et al. (U.S. Pat. 6,278,973) teaches a method of on-demand finite-state automata composition that supports creating new networks from an initial network by

combining network machines or creating arcs between unconnected states (col. 7, line 44 to col. 8, lines 31).

7.   Kiraz ("Multitiered Nonlinear Morphology Using Multitage Finite Automata: A Case Study on Syria and Arabic"), cited by the applicant, teaches creating a finite state network for each entry in a lexicon and computing the cross product of all the finite state networks to create a finite state network for the entire lexicon (section 4.1, page 86).

8.   It would not have been obvious to one of ordinary skill in the art at the time of invention to modify the systems of Kempe, Chung and Kiraz to arrive at the applicant's invention.

9.   Claims 2-14 and 16-20 would be allowable because they further limit the claims to which they refer.

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Karttunen ("The Replace Operator"), Kempe et al. ("Parallel Replacement in Finite State Calculus") and Karttunen (U.S. Pat. 6,023,760) teach compiling finite-state networks from regular expression rules. Mohri (U.S. Pat. 6,032,111) teaches computing finite-state networks for rewriting input speech. Roche (Factorization of Finite-State Transducers") teaches factoring FSTs in order to simplify the searching procedure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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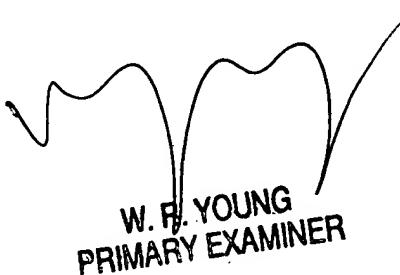
W. R. YOUNG
PRIMARY EXAMINER